



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/532,147

10/20/2005

Spencer Shorte

B1180/20036

6486

3000 7590 09/12/2008
CAESAR, RIVISE, BERNSTEIN,
COHEN & POKOTILOW, LTD.
11TH FLOOR, SEVEN PENN CENTER
1635 MARKET STREET
PHILADELPHIA, PA 19103-2212

EXAMINER

BITAR, NANCY

ART UNIT

PAPER NUMBER

2624

NOTIFICATION DATE

DELIVERY MODE

09/12/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@crbcp.com

Office Action Summary	Application No. 10/532,147	Applicant(s) SHORTE ET AL.	
	Examiner NANCY BITAR	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/20/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Examiner Notes

1. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giovanni De Gasperis (dielectric characterization of living cells by real-time motion estimation) in view of Schaack et al. (US 7161741).

As to claim 1, G.De Gasperis et al. teaches the method for high-resolution image recording of at least one object with a microscope comprising the steps of:

Art Unit: 2624

positioning the at least one object in a receptacle arranged in an optical axis of the microscope (The frame grabber included a real-time image processor (Image Series 640 C Neighborhood Processor with on-board 4 Mb memory, Matrix Electronic Systems Ltd, Dorval, Canada) that was used to acquire images and to accelerate point-to point image operations, section 4.2, figure 4), generating at least two first data sets per object, wherein the at least two first data sets represent intermediate images of the at least one object with at least two different orientations relative to the optical axis of the microscope, and the at least two different orientations of the object are provided by moving the at least one object relative to the receptacle (, figure 4 , note that The first estimator tracks the cell position every three sampling intervals, using an 'optical 2D centre of gravity' calculation, as shown in the appendix. A Cartesian-to-polar coordinate transformation is then implemented from the centre of rotation so that a rotation of the cell in the Cartesian space corresponds to a lateral translation in the polar space.

Observed cell motion in a rotating field experiment generally is a combination of translation and rotation, section 2), and evaluating the data sets for obtaining quantitative three dimensional information (SVGA display, note that Human intervention is required only for the selection and positioning of a new cell with laser tweezers and for focus/brightness adjustment prior to the measurement of each spectrum). While G.De Gasperis et al. meets a number of the limitations of the claimed invention, as pointed out more fully above, G.De Gasperis et al. fails to specifically teach the two different orientation of the object are provided by moving the at least one object relative to the receptacle. Specifically, Schaack et al. teaches the use Methods for calibrating change in relative magnification and deviation of the optical axis with focal shift are disclosed, as are methods for incorporating these changes into perspective dimensional measurements.

Art Unit: 2624

Embodiments are disclosed in which only a single quantity need be measured to perform the correction, and these embodiments require only a low-resolution position transducer to provide accurate measurements. Moreover, Schaack teaches additional parameters are determined during optical calibration are the location of the optical axis on the image sensor and the distortion of the image. Schaack also teaches performing accurate three-dimensional metrology while also allowing an adjustment of focus to best view an object of interest, while moving along the optical axis to adjust the focal state(see figure 1, 9 and 15) . Moreover, Schaack teaches an improved system, suitable for incorporating the relative magnification and perspective measurements (column 47, lines 46, column 48, lines 1-63). It would have been obvious to one of ordinary skill in the art to determine the orientation of the objects relative to the optical axis in Gasperis et al. in order to minimize the effects of optical aberrations and vignetting and allowing to obtain accurate metrology .Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, G.De Gasperis et al. in view of Schaack, teaches the method according to claim 1, wherein said moving of the at least one object relative to the receptacle comprises a translation and/or rotation of the at least one object by an influence of electric field forces (The performance of this system is characterized in terms of robustness, accuracy and linearity with respect to manual measurements of real spinning cells under the influence of a rotating electric field, abstract and see section 3, page 528).

As to claim 3, G.De Gasperis et al. in view of Schaack teaches the method according to claim 2, wherein said translation comprises at least one translation parallel and/or perpendicular relative to the optical axis (figure 7, note that The rotation estimation algorithm correlates, in the

Art Unit: 2624

polar space, the current frame with the previous frame as a function of left or right translation (in the θ direction), such a lateral translation in polar space is the equivalent of a rotation in the cell's Cartesian space, see section 3).

As to claim 4, G.De Gasperis et al. in view of Schaack teach the method according to claim 2, wherein said rotation comprises at least one rotation with a rotation axis parallel to the optical axis (Figure 3. The algorithm is composed of two parallel processes—a centre tracking estimator (CTE) and a rotational estimator (RE), page 521).

As to claim 5, G.De Gasperis et al. in view of Schaack teach the method according to claim 2, wherein said rotation comprises at least one rotation with a rotation axis slanted relative to the optical axis.

As to claim 6, G.De Gasperis et al. in view of Schaack teaches the method according to claim 5, wherein said rotation axis is slanted within an angle range of up to 90° (figure 3)

The limitation of claims 7 and 8 has been addressed in G.De Gasperis et al. section 3 and Schaack et al figure 5.

As to claim 9 G.De Gasperis et al. in view of Schaack teaches the method according to claim 1 one of the foregoing claims, further comprising steps of generating further intermediate images of the object, each with another focal plane, respectively, wherein each said focal planes is adjusted by scanning an objective of the microscope parallel to the optical axis (The algorithm was shown to be robust under a wide range of operational conditions and, when coupled with a 1 Hz to 200 MHz computer-controlled signal generator and laser tweezers to select and hold the cell in place, the method allowed sustained automatic measurement of many complete ROT spectra per hour with minimal manual intervention (i.e. chamber load and flush, cell selection,

Art Unit: 2624

focus/brightness adjustment). The laser tweezers allowed the operator to choose cells for measurement, page 526, column 2). See also Schaack et al teaches physical elements of the optical system are shifted in order to change the focal state, any of the z axis positions associated with the model of the optical system, as well as its focal length, may change, see figure 32.

As to claim 10 G.De Gasperis et al. in view of Schaack teaches the method according to claim 9, wherein said at least two different orientations of the object and said scanning an objective are conducted in an alternating mode (Better results are obtained using a quadratic estimator, being defined by a weighted average of the three angular positions, section 3), see also Schaack et al figure 12.

As to claim 11 G.De Gasperis et al. in view of Schaack teaches the method according to claim 1 one of the foregoing claims, wherein said positioning comprises suspending said at least one object in a liquid in said receptacle (The cell is suspended in a chamber between thin film polynomial electrodes and spins under the influence of an applied electric field. Four sinusoidal waveforms, having a quadrature phase relationship, are applied to the four electrodes and this creates a rotating field between the poles, section 2, page 519).

As to claim 12, G.De Gasperis et al. in view of Schaack teaches the method according to claim 1 one of the foregoing claims, wherein said evaluating of the resulting data sets comprises a procedure intended to remove out- of-focus light and/or reconstruct a three dimensional map/image of the imaged object (One can also reduce the change in distortion in out of focus images for extremely critical applications by modifying the optical design of the projection lens, column 54, lines 61-67).

As to claim 13, G.De Gasperis et al. in view of Schaack teaches the method according to claim 1, wherein said at least one object comprises at least one eukaryotic cell, at least one prokaryotic cell and/or at least one artificial particle (ROT has been employed for characterizing mammalian cells [12–15], human platelets [16], yeast cells[4, 17, 18] and bacteria [19] as well as other bio-particles including liposomes [20] and protoplasts [21] without introducing any destructive interactions, section 1, Introduction).

As to claim 14, G.De Gasperis et al. in view of Schaack teaches the method according to claim 1 one of the foregoing claims, wherein said microscope is used as a fluorescence microscope, a phase contrast microscope, a differential interference contrast microscope or a confocal microscope (table 1,note that The rotating electrical field for ROT experiments was provided by applying four sine waves in phase quadrature to the electrode array in the electrorotation chamber, section 4.1, page 522, see also laser tweezers, figure 4).

The limitation of claim 15 has been addressed above except for the receptacle arranged in the optical axis and the control circuit being arranged for generating the two data sets. Schaack teaches that limitation in figure 9 and column 17, lines 30-64.

The limitation of claims 16-20 has been addressed in claim 1 above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jinge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar

9/1/2008

/Samir A. Ahmed/
Supervisory Patent Examiner, Art Unit 2624